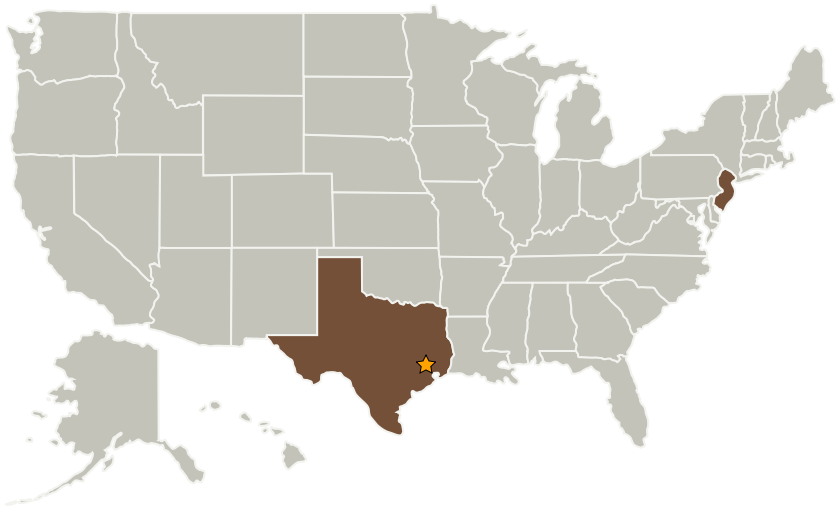
Battery separator membrane having a selectable thermal shut-down temperature, Phase I

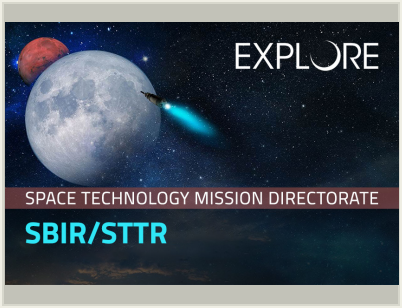
Completed Technology Project (2004 - 2004)

Project Introduction

This Small Business Innovation Research Phase I proposal to NASA requests $69,367.13 support for Policell Technologies, Inc. to demonstrate the feasibility of developing a novel battery separator membrane having a selectable thermal shut-down temperature (from 60 to 120 deg C). The separator will be used for making high energy density rechargeable battery. This proposal responds to Topic Number F3.09, ?Power Technologies for Human Missions?. The significance of the innovations is that with the use of the novel separator membrane, the resulting rechargeable lithium-ion battery will:1) have a selectable thermal shut-down temperature to meet the requirements for any particular application. Therefore, the battery will have an improved safety and reliability,2) offer higher energy density, 3) have longer cycle life, lower as well as stable impedance during charge-discharge cycling and 4) offer low cost since the separator could eliminate the use of such safety device as PTC and circuitry for lithium-ion battery. The innovation in the separator will be to develop a separator system which has a selectable thermal shut-down temperature. The commercial applications include: used for rechargeable battery as mobile power sources for such devices as cellular phones, notebook computers, military used devices, and hybrid electric vehicles (HEV). The NASA applications include: mobile power sources for space. The Principal Investigator, Luying Sun, Ph.D., is qualified to perform this work as he has been an expert in this field. Since 1993, the Principal Investigator has been involved in the research and development of separator membrane, electrolyte, and lithium-ion battery.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Policell Technologies, Inc.	Supporting Organization	Industry	Newark, New Jersey

Primary U.S. Work Locations	
New Jersey	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Luying Sun

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.2 Energy Storage
    - TX03.2.1 Electrochemical: Batteries